

General Description

The AGM502 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

This device is ideal for load switch and battery protection applications.

Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- ESD 2KV

Application

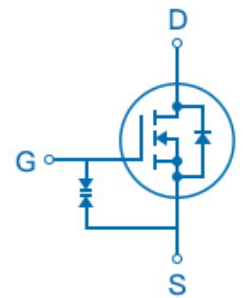
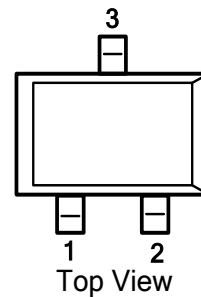
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Package Marking and Ordering Information

Product Summary

BVDSS	RDSON	ID
60V	2.0Ω	0.3A

SOT-523 Pin Configuration



Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
50A	AGM502	SOT-523	178mm	8mm	3000

Table 1. Absolute Maximum Ratings (TA=25°C)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	60	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(TA=25°C) (Note 1)	0.3	A
	Drain Current-Continuous(TA=100°C)	0.19	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	1.2	A
PD	Maximum Power Dissipation(TA=25°C)	0.35	w
EAS	Avalanche energy (Note 3)	--	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) ¹	---	350	°C/W

Table 3. Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±2	μA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.6	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=0.2A	--	--	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=0.3A	--	2.0	2.5	Ω
		VGS=4.5V, ID=0.2A	--	2.5	3.5	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V,VGS=0V, F=1MHZ	--	28	--	pF
Coss	Output Capacitance		--	9.0	--	pF
Crss	Reverse Transfer Capacitance		--	2.0	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V, RG=10Ω,RL=150Ω, ID=0.2A	--	8.5	--	nS
tr	Turn-on Rise Time		--	--	--	nS
td(off)	Turn-Off Delay Time		--	31.9	--	nS
tf	Turn-Off Fall Time		--	--	--	nS
Qg	Total Gate Charge	VGS=4.5V, VDS=15V, ID=0.2A	--	1.7	--	nC
Qgs	Gate-Source Charge		--	0.4	--	nC
Qgd	Gate-Drain Charge		--	0.2	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	0.3	A
VSD	Forward on Voltage	VGS=0V,IS=0.2A	--	--	1.2	V
trr	Reverse Recovery Time	IF=0.2A , dI/dt=100A/μs , TJ=25℃	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 3.EAS condition: T_J=25°C

Test Circuit and Waveform

Figure A: Gate Charge Test Circuit and Waveform

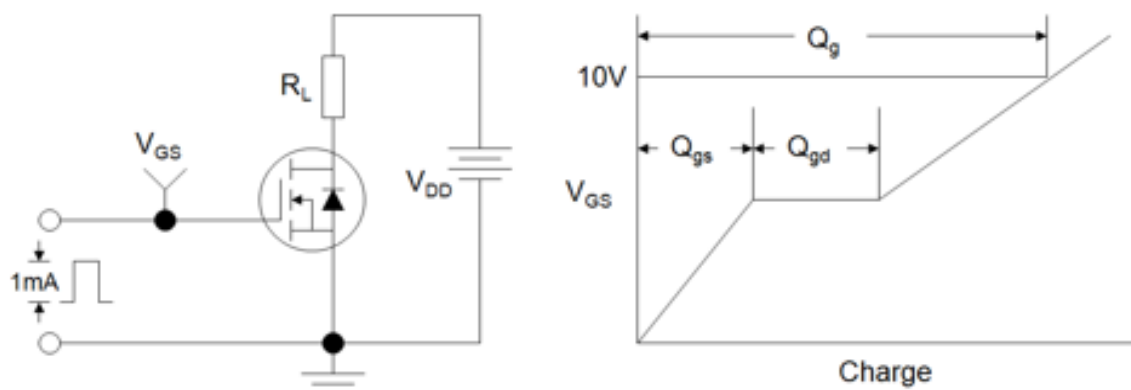


Figure B: Resistive Switching Test Circuit and Waveform

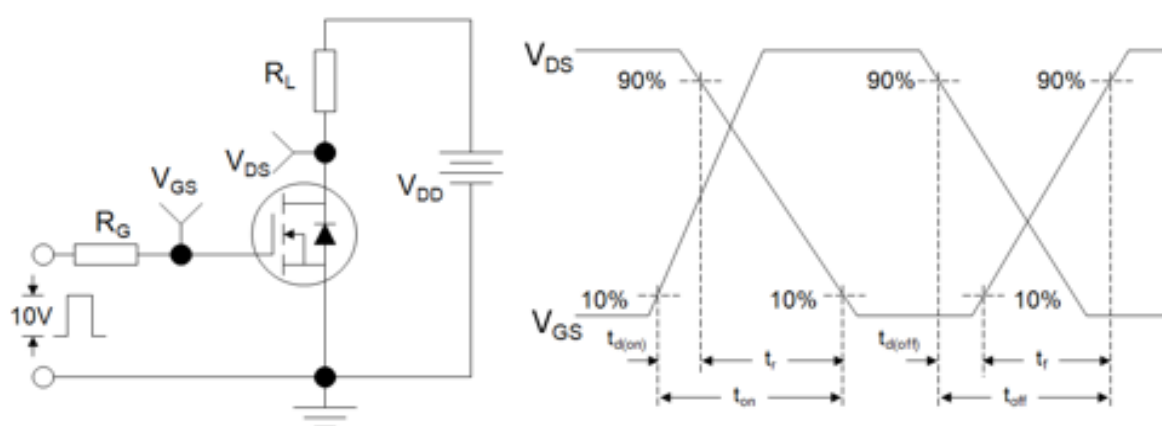
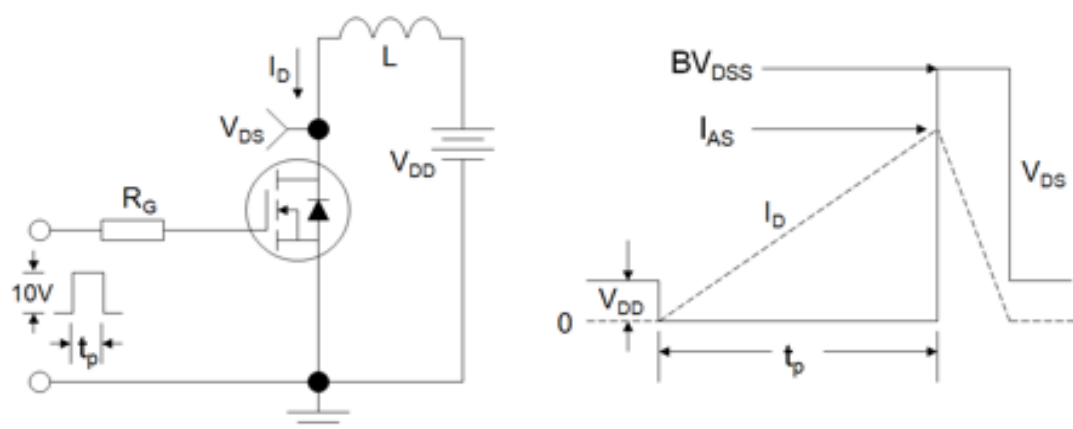


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



■ Typical Performance Characteristics

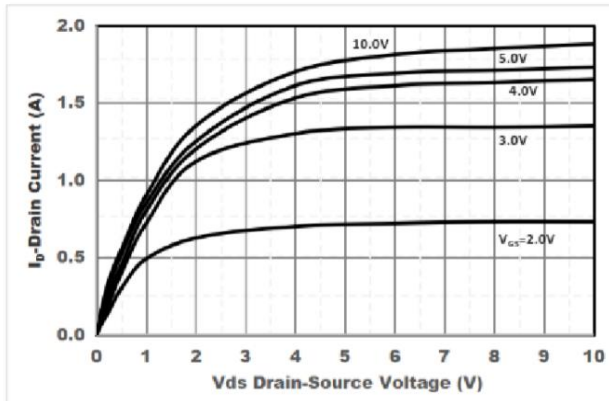


Figure1. Output Characteristics

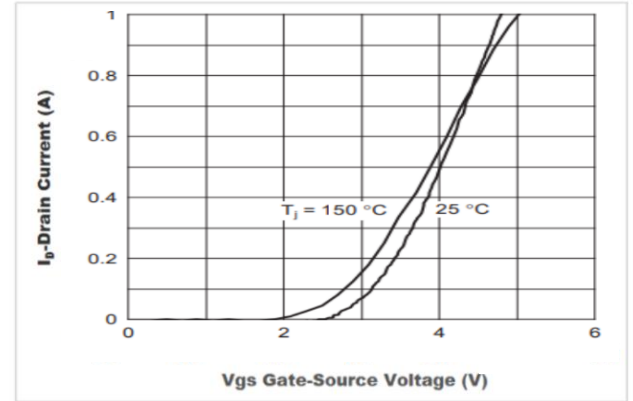


Figure2. Transfer Characteristics

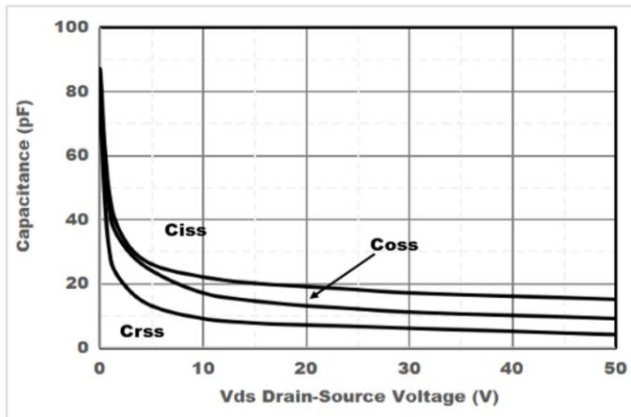


Figure3. Capacitance Characteristics

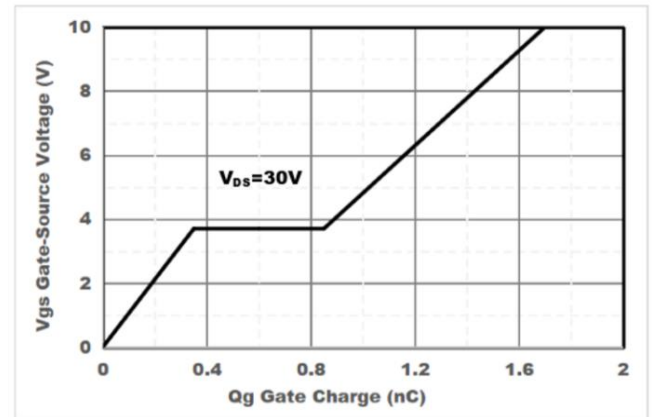


Figure4. Gate Charge

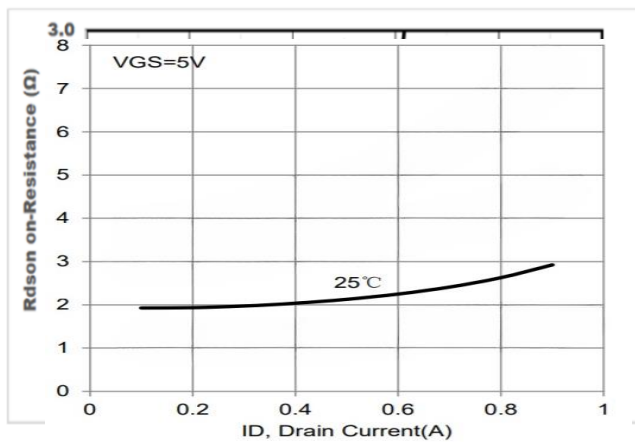


Figure5. Drain-Source on Resistance

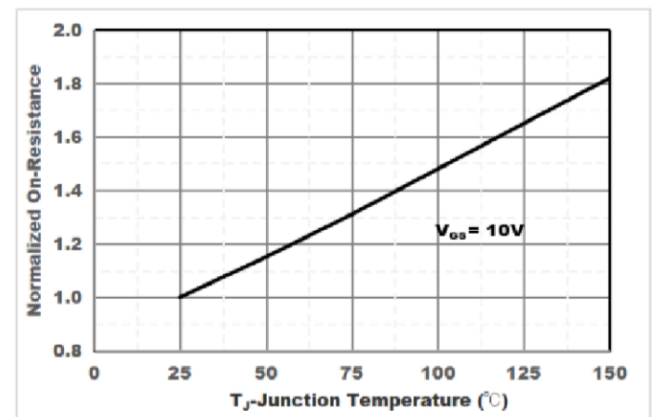


Figure6. Drain-Source on Resistance

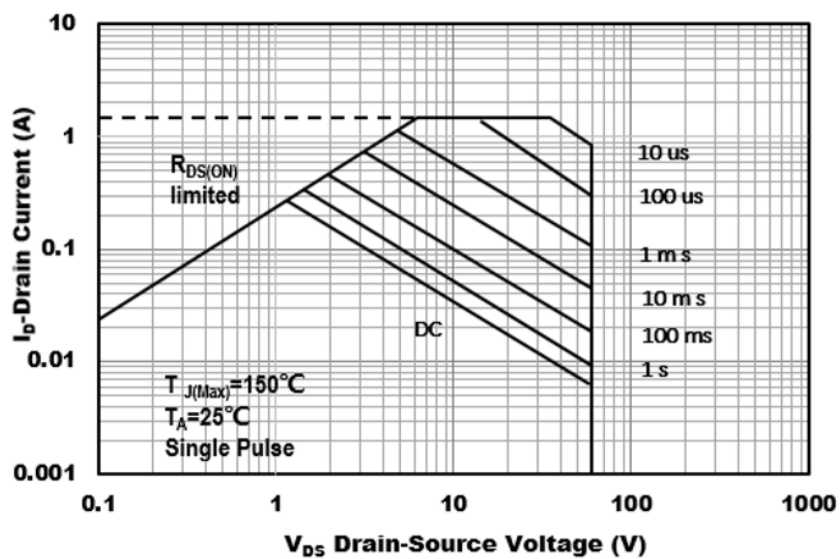
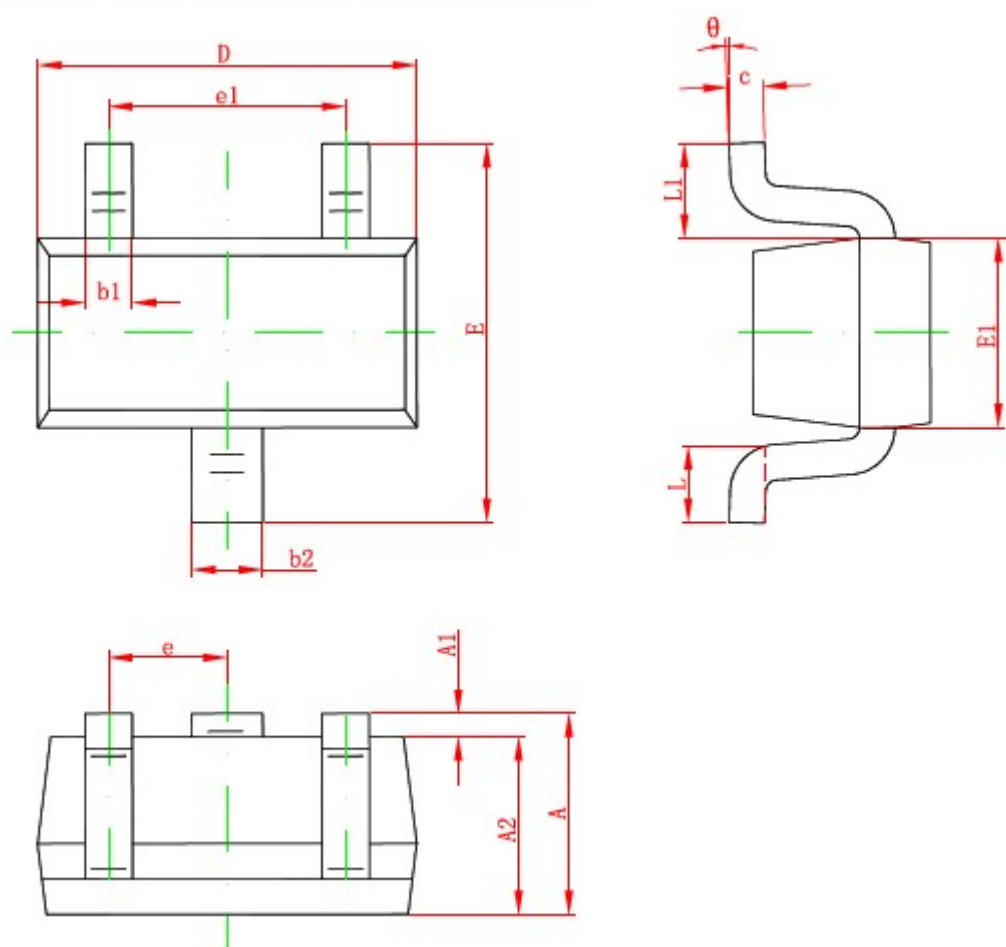


Figure7. Safe Operation Area

SOT-523 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	1.450	1.750	0.057	0.069
E1	0.700	0.900	0.028	0.035
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.260	0.460	0.010	0.018
L1	0.400 REF.		0.016 REF.	
θ	0°	8°	0°	8°

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